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INSTITUTIONAL DESIGN OF RoSCAs: WHAT LESSONS FOR NGOs IN THE GAMBIA?

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Abstract

Institutional design for fund allocation by indigenous RoSCAs in The Gambia is examined and compared to NGO RoSCAs that mimic them to provide financial services. Econometric results indicate that NGO design is consistent with indigenous RoSCAs if it recruits members with similar cash flows and use for funds. This has implications for NGOs organizing RoSCAs to provide financial services.

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Sub-Saharan African countries have a wide variety of indigenous village level institutions. At the same time, many new institutions are being introduced by external agencies, especially NGOs. It is important to carefully examine the design and functioning of indigenous institutions so that new institutions can be designed that will not damage the positive attributes of existing institutions, but serve as institutional improvements. This is particularly important where NGOs have become active in providing financial services in villages either by channeling these services through indigenous groups or by creating new indigenous group-like institutions.

Rotating Savings and Credit Associations (RoSCAs) are one type of indigenous association that provide financial services in many developing countries.[1] They service a wide variety of customers employed in various occupations and are often composed primarily of women members. While the majority of RoSCAs mediate only small amounts of funds, large ones exist such as in Cameroon and Niger where the volume of funds intermediated are comparable to that of formal credit unions (Bouman, 1994). In the typical RoSCA, the members agree to contribute a fixed amount of cash and/or goods into a common fund or pot at regular intervals.[2] The pot is then

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[1] RoSCAs are known as tontines in francophone West Africa, dashi and isusu among various tribes in Nigeria, susu in Ghana, ekub in Ethiopia, gamias in Egypt, upatu in Tanzania, and chilemba in several parts of east Africa, to name a few (van den Brink and Chavas, 1991).

[2] The terms pot and fund are used interchangeably in this paper.

allotted to one member (sometimes more), based upon some previously agreed criteria that may involve a fixed order, a lottery or an auction. Each member contributes a fixed amount at each turn or rotation and receives the pot once until the entire cycle is completed; then the group may disband or the cycle may recommence with the same or a different set of members and terms and conditions.

In The Gambia, RoSCAs are called osusus. There exist several indigenous osusus organized by members themselves but recently NGOs have become active in forming osusus. While the NGO osusus mimic some characteristics of indigenous osusus such as in membership size, they vary in their fund allocation technique. The indigenous osusus use several types of fund allocation methods designed to fit member needs but the NGO osusus usually insist on using just one type which is the lottery method. Indeed, the lottery method may be the only feasible method given their limited information about member requirements. The method used by an osusu to allocate the pot at each rotation is an important element of institutional design because it serves as a mechanism for resource allocation among the osusu members. A well designed institution is expected to facilitate optimal resource allocation among the members of the society by assigning user rights (Eggertsson, 1990). The method selected is expected to be a manifestation of member characteristics and preferences (Besley, 1992), and of the region specific micro and macro environment. A mismatch between the NGO selection of method of fund allocation for the osusus and the interests of the members will likely lead to unsustainable institutions. In the extreme case, the mismatch could create negative externalities for well functioning indigenous village osusus by undermining their operations.

While a few studies have theoretically examined the determinants of fund allocation methods in RoSCAs under certain restrictive assumptions about member preferences (Besley et al.1993a; van den Brink, 1991), no studies can be found that attempt to empirically test theoretical propositions. This paper using data collected from 93 osusus in The Gambia attempts to: (i) provide some insights into the determinants of fund allocation methods of indigenous osusus, (ii) examine if the pot allocation technique of a NGO organized osusu is consistent with indigenous osusus so that it complements rather than undermines indigenous osusus, and (iii) suggest features of osusus that NGOs might consider as they design osusus that are compatible with member preferences. After describing the data, a conceptual framework regarding the determinants of fund allocation methods is discussed and econometrically tested in the following sections. Policy implications conclude the paper.

Description of Data

Whereas the majority of osusus in the Gambia are indigenously formed, a national NGO, Women in Service, Development, Organization and Management (WISDOM), is actively organizing osusu-like groups primarily for women, and is linking them with formal financial institutions.[3] Therefore, a random sample of 93 osusus, 87 indigenous and five WISDOM osusus, functioning

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[3] WISDOM is a national NGO and was started in 1989 to: (i) provide technical skills and functional literacy to women microentreprenuers and farmers; (ii) create awareness of gender issues; and (iii) organize women into functional groups such as osusus and strengthen these groups by linking them with formal financial institutions. Currently, WISDOM covers about 300 villages in the country serving 9,000 members. A total of 400 osusus have been formed through out the country with 130 located in the peri-urban Banjul. For more information, refer to Nagarajan et al., 1994.

in six villages surrounding Banjul were randomly selected for the study and the leaders were interviewed using a structured questionnaire during February-April of 1993. The sample was limited to osusus composed of individuals engaged in five specific sets of activities including civil service, farming, and food, fruit and vegetable retailing and tie-dye retailing.

Membership sizes vary among osusus but generally they are small. Within osusus, membership characteristics tend to be homogenous in age or ethnicity or gender or occupation or a combination of all the above in order to reduce principal-agent problems inherent in financial transactions due to asymmetric information.

In an osusu, members who receive their pot before the end of the entire cycle get a loan free of explicit interest. These members repay their loans in installments through their subsequent regular contributions to the pot.[4] The last member to receive the pot is a saver who has given out a loan free of interest. Therefore, osusus allow all the members except the last one in the rotation to immediately consume their future savings in the form of an interest free loan. However, osusus use several methods including fixed orders, lotteries or auctions to establish the order of priority for distribution of each pot. These pot allocation methods can serve as a rationing mechanism to reduce mis-allocation of funds, and are a manifestation of member preferences.

The methods of pot allocation, based on evidence from The Gambia and the literature, can be described as follows [5]:

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[4] Members placed at the end of the cycle get smaller effective loans because most of their pot represents returned deposits rather than loans (Schreiner, 1995).

[5] Several RoSCAs in Bolivia and several other Latin American countries use lottery methods followed by order of recruitment to allocate funds (Adams and Canavesi, 1992), while Asian countries such as Taiwan and Korea use lottery and bidding systems (Besley et al., 1993b).

Fixed in some order: The members may get the pot according to the order in which they are recruited into the ososu. Although the order is permanent, a few ososus alter it every cycle to provide an equal opportunity to members who were recruited late into the ososu.[6] In some ososus, the order is fixed according to age or seniority. Seniority is decided either by the number of hands played by a member [7] or the number of members recruited by the member into the ososu.

By request: In this alternative, the ososus allocate funds based on the order of the requests made by members to receive the pot. Usually this system works on a first-come first-served basis. But members with emergencies, such as funerals, medical expenses, theft and fire, are given priority.

Lottery: Funds may be allocated through a lottery that is held at the beginning of the ososu or at every periodic rotation. The members who have already received their pots are excluded from subsequent lotteries.

Auction: An auction may be held in which the members bid for the pot in the form of a pledge of higher contributions to the ososu, or a one time side payment to other members, or a willingness to accept a smaller pot. As in other types, only those members who have not received the pot once in the entire cycle are allowed to bid for a particular pot.

However, several RoSCAs in some African countries such as Niger allocate funds based on the request of their members (Graham, 1992).

[6] This may result in some members getting pots back-to-back. This enables them to either auction one of the pots or use the funds for some lumpy investment.

[7] Hands refer to the number of contributions that a member makes at each rotation period. One member may contribute more than one hand in order to receive the pot more than once during the complete rotation. Alternatively, persons with insufficient cash may band together to contribute one hand.

We now provide a brief comparison of indigenous and NGO ososus.

Comparison of Indigenous and WISDOM Ososus

Selected features of the indigenous and WISDOM ososus sampled for this study are presented in table 1. In both type of ososus, the members voluntarily agree to contribute a fixed amount of money at fixed periods to a common fund/pot that rotates among the members. While the members may contribute in installments any time before the pot is distributed, the pot will be allotted only at the agreed time. Both the indigenous and WISDOM ososus were generally small in their total membership. The members in both types of ososus were allowed to informally swap their turns in the rotation regardless of the allocation method. Ososu leaders reported that several members deferred the receipt of their pot or informally lent it to another member when they did not personally have a good use for it. Generally, new members in an ososu were placed in the last positions to receive the pot.

Several differences were noticed in design, however, between the indigenous and WISDOM ososus. While the members of the WISDOM ososus were usually women engaged in various types of economic activities but residing and/or working in close geographic proximity, the majority of the indigenous ososus were gender neutral and the members were engaged in similar economic activities. The average pot size was larger in WISDOM ososus compared to indigenous ososus. Whereas indigenous ososus followed several methods to allocate the funds, the WISDOM ososus used only the lottery method. The members of indigenous ososus were allowed to participate in more than one ososu at a time but WISDOM members were restricted to only one. These design features have various implications for the operational methods of the ososus as will be seen in the following sections.

Conceptual Model

Besley et al. (1992) shows that while RoSCAs are not generally allocatively efficient compared to credit markets, the lottery method of pot allocation, under certain assumptions, pare to dominates credit market outcomes. Therefore, the WISDOM osusus that use the lottery method to allocate funds may be an institutional improvement over the indigenous osusus.

It is important that the choice of the lottery method be consistent with member preferences which eventually affect the demand for osusu services including the allocation of funds at the desired time. Member preferences are determined in part by the membership composition that can be either homogenous or heterogenous. The homogeneity can be in terms of age or gender or ethnicity or geographic proximity in work place/residence or occupations of members or combinations of all the above. It is necessary to have some degree of homogeneity among members to reduce information problems, and to facilitate the design of fairly representative terms and conditions that are compatible with the regularity of cashflows of the members.

The WISDOM osusus are composed of occupationally heterogenous members who reside and/or work in close proximity. In contrast, the indigenous osusus are composed of occupationally homogenous members but who may reside in more scattered location. The benefits of occupational diversification in the WISDOM osusus are likely to outweigh the benefits associated with occupational homogeneity in indigenous osusus. This is because region specific risks may have a differential impact on members engaged in different types of income generating activities. Therefore, region-wide income shocks may have less effect on an osusu composed of occupationally heterogenous members. The lucky members may co-insure the unlucky members if a cohesive osusu consists of members bounded by moral obligations. Furthermore, little

information is lost through employment diversification since all members reside and/or work in close proximity.

Besley et al. (1992, 1993a) showed that the RoSCAs that were formed among members with homogenous preferences to purchase some indivisible good would prefer a lottery over the auction method of pot allocation.[8] Conversely, with sufficient dispersion in member preferences, auctioning will be chosen over lotteries so that those who value the pot the most can acquire it early in the rotation. The above postulates are based on choices between the lottery and bidding types of pot allocation for members who desire to purchase some indivisible good but participate in only one RoSCA. The analysis can be empirically extended to predict choice among lottery, fixed order and simple request options, and to members who participate in more than one RoSCA to meet consumption and investment expenses, and social obligations.

Let us suppose that all RoSCAs follow the same financial policies including the cycle length, size of periodic contribution, and membership size but vary in membership composition, and that all members of a RoSCA use the funds to finance similar activities.[9] The RoSCAs can be expected to determine the pot allocation method given optimal membership size and composition, and financial policies. Extending Besley's arguments, the following postulates can be derived for empirical validation:

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[8] Besley derived his propositions based on the assumptions that members are homogenous in their incomes, have no time preferences, incur no transaction costs and operate in a deterministic environment.

[9] This may not include consumption smoothing activities that may vary among members.

Postulate 1: RoSCAs that are composed of members with homogenous preferences will choose a lottery over other methods. Conversely, those composed of less homogenous memberships will tend to prefer a simple request option rather than a lottery; RoSCAs with heterogenous members will choose ordering method rather than lotteries to allocate funds.

The choice of lottery over other methods is due to the synchronization in fund requirements by all members with similar preferences in a homogenous RoSCA. Therefore, randomness in pot allocation will be preferred to help avoid stronger members overriding weaker members.

The choice of request and ordering methods over lotteries occurs when members with heterogenous or less homogenous preferences may not need the funds at the same time. The covariance in members' incomes is less so there is less synchronization in the need for funds. The request for pots also induces the new members to reveal their preferences thereby functioning as a signalling mechanism in RoSCAs who have less information about each other compared to others with more homogenous members. This information can be effectively utilized to monitor the member so that moral hazard problems can be minimized. Furthermore, the assurance of funds in times of need provides a type of insurance to members.

Postulate 2: A relatively less heterogenous group will prefer ordering rather than the simple request option.

Ordering prevents crowding out of members with less diverse preferences and flow of incomes. When members are more homogenous, they may require the funds at the same time and hence may have to queue up for the same pot. This gives an opportunity for some powerful members to crowd out the weaker ones who may desperately need the pot.

Postulate 3: A homogenous group with an option to participate in more than one RoSCA will prefer ordering and simple request options rather than the lottery method.

Participation in multiple ososus allow relatively homogenous members to reduce the mismatch that might occur between their incomes and the rotation periods of their primary ososu since they can cross-subsidize with pots from other ososus.

The above three postulates were tested on data from The Gambia described above.

Econometric Analysis and Results

It can be postulated that an ososu will prefer a pot allocation method that suits the characteristics of its members and the operational rules regarding contribution size, cycle length, membership composition and membership participation in multiple ososus. The WISDOM ososus are excluded from the econometric analysis since the allocation method is imposed upon the members rather than chosen by them. Since the ososus are faced with three allocation choices, a multinomial logit model is used to examine the determinants of pot allocation methods.

The explanatory variables include member characteristics represented by dummy variables for homogeneity in gender (GENDER), age (AGE) and employment type(s) of the members, where the variables take the value one in the presence of homogeneity, and zero otherwise. The members are considered homogenous in gender if all the members belong to the same gender, homogenous in age if the difference in members' age does not exceed 15 years, and homogenous in employment when over 75 percent of the members are employed in the same sector. The employment categories include civil service (CIVIL), farming (FARM), food retailing (FOOD), fruit and vegetable retailing (F&V) and tie-dye retailing (TIE-DYE). The financial policies of the osu-

sus are represented by the amount of contribution per member per rotation (CONTRIB), cycle length in days (CYCLE) and a dummy variable for non-exclusivity (NONEXCLUS) where the variable takes the value of one if members are allowed to participate in multiple osusus, and zero otherwise.

The regression results are presented in table 2. Significant chi-square values confirm the explanatory power of the model. The results generally confirm the postulates presented above. The multinomial logit results need to be interpreted with respect to the reference variable. In table 2, while columns two and three present the determinants of the order and request options compared to the lottery option (the reference case), column four presents the determinants of ordering compared to request option (the reference case). The results can be summarized as follows.

The significance of the negative sign for AGE and the positive sign for NONEXCLUS in columns two and three indicates that members less homogenous in age but participating in multiple osusus prefer the order and the request options to the lottery methods. In other words, members homogenous in age and participating in only one osusu prefer lottery over ordering; members homogenous in age, civil servants and participating in only one osusu prefer lottery over the request option. Although insignificant, members who are homogenous in terms of age or gender or a combination of age and gender (AGE*GENDER) tend to prefer the lottery option over the request and ordering options. These results support postulate one and three that states that homogenous members participating in only one osusu prefer the lottery over all other methods of pot allocation.

In terms of choice between order and request options, members participating in non-exclusive ososus with a longer cycle length tend to choose ordering compared to the simple request option. The insignificant coefficients for the majority of the variables presented in column 4 shows that member homogeneity reflecting member preferences does not significantly influence the allocation method choices. These results do not adequately support postulate two.

Our results corroborate Besley et al. (1993a) only in that the occupational homogeneity of members employed in civil service leads to the choice of the lottery method. However, our analysis additionally shows that while homogeneity in gender, age and employment types need to be considered in determining the pot allocation technique, the non-exclusivity criteria plays a significant role. These results have implications for the NGOs that design ososus. If members are restricted to participate in only one ososu and if they are homogenous in age and gender but heterogenous in employment type, the members will likely choose a lottery method compared to ordering and request options. The exceptions are civil service and farming. The results support the use of the lottery method in WISDOM ososus that restrict membership to only one ososu by women members employed in heterogenous economic activities. However, the WISDOM's pot allocation method is consistent with the indigenous ososus only if the members are homogenous in age and if the membership does not mix civil servants and farmers along with different types of retailers [10].

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[10] Our interviews reveal that civil servants have stable incomes, contribute larger amounts, prefer longer cycles and use the funds to purchase consumption goods. Farmers, on the contrary, have unstable incomes, contribute smaller amounts, prefer shorter cycles and use the funds for consumption and farm production purposes. There is obviously a friction in member preferences between farmers and civil servants.

Summary and Implications

Osusus provide valuable financial services to low income persons who have difficult access to formal financial services in The Gambia. Recently, NGOs have become active in using existing osusus or creating osusu-like associations to channel their financial services to villagers. While the indigenous osusus are designed by their members, the NGO osusus are designed by external donors. A mismatch between the design of NGO osusus and member interests can lead to unsustainable institutions. This paper examined the determinants of resource allocation methods, a major institutional design feature, used by indigenous osusus in order to gain insights into the appropriateness of NGO designed osusus. The results show that while the design of one NGO is consistent with choices made in indigenous osusus, caution is needed when NGOs attempt to diversify their membership portfolio through recruiting members with heterogenous occupations. Designing NGO financial programs to mimic indigenous osusus may both increase their probability of success and reduce their potential damage to indigenous osusus by complementing them for a positive sum game.

Table 1. Selected Characteristics of Indigenous and NGO Osusus

Osusus/members	No. of Osusus Sampled	Ave.no. of members [a]	Ave. pot size per rotation (Dalassi)[b]	Ave. cycle length (days)	Allocation Methods (number of osusus reporting)		
					Lottery	Order	Request
A. Indigenous Osusus							
Civil servants	8	15 (87)	2,690	450	6	2	0
Farmers	15	21 (90)	136	192	1	10	4
Food vendors	5	21 (98)	450	91	1	2	2
Fruit and vegetable vendors	52	23 (89)	535	128	5	21	26
Tie-dye sellers	8	21 (95)	2,150	91	2	2	4
B. WISDOM osusus	5	26 (98)	10,363	199	5	0	0
Total	93	22 (89)	2,981	150	20	37	36

a. Percent of female to total members given in parentheses
b. Dalassi 8.2 = US $1

Table 2. Determinants of Fund Allocation Methods in Indigenous Osusus: Results of Multinomial Logit Regression

Independent Variables	Fund Allocation Methods		
	Order/Lottery	Request/Lottery	Order/Request
(1)	(2)	(3)	(4)
Constant	-16.58 (35.9)	-13.91 (54.4)	-0.80 (6.2)
GENDER	-0.92 (1.8)	-12.66 (53.8)	-12.95 (52.6)
AGE	-12.57 * (9.5)	-24.10 * (19.4)	-11.60 (51.4)
GENDER*AGE	-11.81 (40.1)	-23.86 (48.8)	12.19 (51.8)
CIVIL	-11.43 (35.9)	-12.79 * (11.1)	24.38 (47.1)
FARM	13.91 (34.4)	1.83 * (1.5)	11.76 (34.4)
F&V	13.51 (34.8)	1.81 (1.9)	11.43 (36.2)
TIE-DYE	13.03 (35.2)	1.18 (1.3)	11.55 (32.8)
CONTRIB	-0.24 (0.5)	-0.11 (0.2)	-0.94 (4.6)
CYCLE	0.20 (0.2)	0.58 (2.6)	0.14 ** (0.05)
NONEXCLUS	1.90 * (1.4)	0.42 ** (0.2)	1.61 * (1.1)
Log-likelihood	-79.74		
Chi-square	38.67		

*, ** represent significance at 10 and 5 percent levels, respectively.
Asymptotic standard errors given in parentheses.

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